

REMARKS

This Application has been carefully reviewed in light of the Office Action mailed August 12, 2004. To clarify various aspects of inventive subject matter, Applicants amend Claims 1-31, 44-48, and 50. Applicants also introduce new Claims 51-52. To advance prosecution of this application, Applicants have responded to each notation by the Examiner. Applicants submit that all of the pending claims are allowable over the cited references. Applicants respectfully request reconsideration, further examination, and favorable action in this case.

Claim Rejections Pursuant to 35 U.S.C. § 112

The Examiner rejected Claim 3 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants have rewritten Claim 3. Applicants believe this amendment does not narrow the scope of the claim, but address the Examiner's rejections under § 112. Applicants respectfully request reconsideration and favorable action in this case.

Information Disclosure Statement

Applicants note for the Examiner's convenience that an Information Disclosure Statement containing the missing references is being filed concurrently with this Response. Applicants respectfully request that the Examiner confirm in the next written communication that the Examiner has considered Applicants' Information Disclosure Statement.

Claim Rejections Pursuant to 35 U.S.C. § 102

The Examiner rejects Claims 1-2, 3, 4-8, 17-21, 23-25, 31, 44, 47, and 50 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No 5,058,974 issued to Mollenauer ("*Mollenauer*"). The Examiner also rejects Claims 12 and 13 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No 5,623,508 issued to Grubb ("*Grubb*"). Applicants respectfully traverse these claim rejections for the reasons discussed below.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987); M.P.E.P. § 2131. In addition, "[t]he elements *must* be arranged as required by the claim." *Richardson v.*

Suzuki Motor Co., 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989); *In re Bond*, 15 U.S.P.Q. 2d 1566 (Fed. Cir. 1990); M.P.E.P. § 2131 (emphasis added). Each of the numerous references cited by the Examiner fails to disclose, teach, or suggest, either expressly or inherently, various limitations recited in Claim 1.

a. Independent Claims 1 and 24 are Patentable over *Mollenauer*

Among other features, amended independent Claim 1 recites, in part, “a distributed Raman gain medium having an optical loss and connected to the input port, the distributed Raman gain medium operable to amplify the optical signal and to compensate for dispersion associated with the at least one transmission link, wherein the distributed Raman gain medium comprises a dispersion-length product that is substantially equal in magnitude to a dispersion-length product of the at least one transmission link and wherein the distributed Raman gain medium comprises a sign of dispersion that is opposite a sign of dispersion associated with the at least one transmission link.”

Mollenauer fails to teach or suggest a number of elements of amended Claim 1. For example, nowhere does *Mollenauer* contemplate a distributed gain medium that compensates for dispersion associated with a transmission link. To the extent that *Mollenauer* discusses a distributed gain media, this discussion is limited to distributed gain fibers that have a dilute rare-earth dopant. See e.g., Col. 2, Lines 1-10. Nowhere does *Mollenauer* teach or disclose that the distributed gain medium comprises a dispersion-length product that is substantially equal in magnitude to a dispersion-length product of the transmission link and that the distributed gain medium comprises a sign of dispersion that is opposite a sign of dispersion of the transmission link. Indeed, *Mollenauer* lacks any disclosure of dispersion compensation or the need for dispersion compensation. Consequently, *Mollenauer* fails to teach or suggest an “a distributed Raman gain medium having an optical loss and connected to the input port, the distributed Raman gain medium operable to amplify the optical signal and to compensate for dispersion associated with the at least one transmission link, wherein the distributed Raman gain medium comprises a dispersion-length product that is substantially equal in magnitude to a dispersion-length product of the at least one transmission link and wherein the distributed Raman gain medium comprises a sign of dispersion that is opposite a sign of dispersion associated with the at least one transmission link.”

Applicants submit that amended independent Claim 1 is patentable over *Mollenauer* for at least the reasons discussed above. Thus, Applicants respectfully request withdrawal of the rejection and full allowance of amended Claim 1 and all claims depending therefrom.

b. Independent Claim 12 is Patentable over *Grubb*

Among other features, amended independent Claim 12 recites, in part, “a pump shunt coupled to the signal input port and the signal output port, the pump shunt operable to couple at least a portion of the pump signal between the first Raman gain segment and the second Raman gain segment, wherein the first Raman gain segment is coupled to the signal input port and the second Raman gain segment is coupled to the signal output port and wherein the pump signal traverses the first Raman gain segment in a direction counter to the first direction and then traverses the second segment to deplete the pump power of the pump signal.”

Grubb fails to teach or suggest a number of elements of amended Claim 12. For example, nowhere does *Grubb* contemplate a pump signal that traverses a first Raman gain segment, which is coupled to a signal input port, in a direction that is counter to a direction that an optical signal is traversing the first Raman gain segment and then having the pump signal traverse a second Raman gain segment, which is coupled to a signal output port. To the extent that *Grubb* discusses a pump signal that traverses both a first and second gain medium, this discussion is limited to a pump signal that traverses a second gain medium, which is coupled to the signal output, and then having the pump signal traverse the first gain medium, which is coupled to the signal input. Consequently, *Grubb* fails to teach or suggest “a pump shunt coupled to the signal input port and the signal output port, the pump shunt operable to couple at least a portion of the pump signal between the first Raman gain segment and the second Raman gain segment, wherein the first Raman gain segment is coupled to the signal input port and the second Raman gain segment is coupled to the signal output port and wherein the pump signal traverses the first Raman gain segment in a direction counter to the first direction and then traverses the second segment to deplete the pump power of the pump light.”

Applicants submit that amended independent Claim 12 is patentable over *Grubb* for at least the reasons discussed above. Thus, Applicants respectfully request withdrawal of the

rejection and full allowance of amended Claim 12 and all claims depending therefrom.

c. Independent Claim 24 is Patentable over *Mollenauer*

Among other features, amended independent Claim 24 recites, in part, “at least one transmission link operable to communicate one or more optical signals in a violet communication band, the at least one transmission link having a length, an optical loss, a dispersion, a sign of dispersion, and a cut-off wavelength, wherein the at least one transmission link comprises a dispersion shifted fiber (DSF) having at least one fiber non-linearity effect and a zero dispersion wavelength.” Amended independent Claim 24 also recites, that an optical element comprises “a pump source operable to generate a pump light to pump the distributed Raman gain medium at a pumping level sufficiently high so that the one or more optical signals experience a net gain in the violet communication band, wherein the net gain experienced in the violet communication band is sufficiently far from the zero dispersion wavelength of the at least one transmission link to avoid the at least one fiber non-linearity effect in the at least one transmission link.”

Mollenauer fails to teach or suggest a number of elements of amended Claim 24. For example, nowhere does *Mollenauer* contemplate a pump source that generates a pump light at a sufficiently high level so that the optical signals in the violet communication band experience a net gain and where the net gain is experienced sufficiently far from the zero dispersion wavelength of the transmission link to avoid the at least one fiber non-linearity effect in the at least one transmission link. To the extent that *Mollenauer* discusses nonlinear effects, this discussion is limited to minimizing large fluctuations in signal level as the optical signal traverses the transmission link to avoid the nonlinear effects. See e.g., Col. 5, Lines 43-62. Consequently, *Mollenauer* fails to teach or suggest an optical element that comprises “a pump source operable to generate a pump light to pump the distributed Raman gain medium at a pumping level sufficiently high so that the one or more optical signals experience a net gain in the violet communication band, wherein the net gain experienced in the violet communication band is sufficiently far from the zero dispersion wavelength of the at least one transmission link to avoid the at least one fiber non-linearity effect in the at least one transmission link.”

Applicants submit that amended independent Claim 24 is patentable over *Mollenauer*

for at least the reasons discussed above. Thus, Applicants respectfully request withdrawal of the rejection and full allowance of amended Claim 24 and all claims depending therefrom.

CONCLUSION

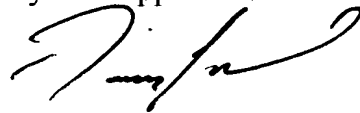
Applicants have made an earnest attempt to place this case in condition for allowance. For the foregoing reasons and for other reasons clearly apparent, Applicants respectfully request reconsideration and full allowance of all pending Claims.

Applicants do not believe that any additional fees are due. However, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker Botts L.L.P.

If the Examiner feels that a conference would advance prosecution of this Application in any manner, Douglas M. Kubehl stands willing to conduct such a telephone interview at the convenience of the Examiner. Mr. Kubehl may be reached at 214-953-6486.

Respectfully submitted,

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